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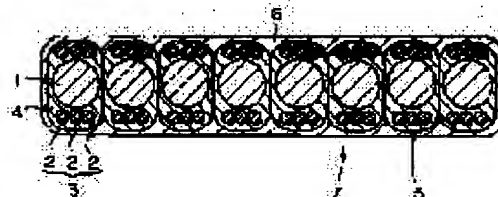
(21)Application number :	09-188762	(71)Applicant :	FUJIKURA LTD NIPPON TELEGR & TELEPH CORP <NTT>
(22)Date of filing :	14.07.1997	(72)Inventor :	OHASHI KEIJI SHIMOMICHI TAKESHI INO ETSUO KOBAYASHI KAZUNAGA ISHIDA KATSUYOSHI TACHIKURA MASAO

(54) OPTICAL FIBER CORD AND RIBBON CORD USING THE SAME AND RIBBON CORD BRANCHING LINE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an optical fiber cord that has an extremely small diameter of ≤ 0.5 mm in finishing outside diameter and has sufficient mechanical strength, and a ribbon cord that allows the simultaneous removal of ribbon forming layers and coating layers including tensile strength members and the simultaneous fusion splicing to ordinary coated fiber ribbons when the ribbon cord is formed by using this optical fiber cord.

SOLUTION: The optical fiber cord 5 is formed by placing ≥1 pieces of the tensile strength members 2, 2... longitudinally along the optical fibers 1 and coating and integrating the both with the coating layers 4. The cross section shape thereof is formed into a rectangular shape and the optical fiber cord is so formed that the parts, where the tensile strength member 2, 2, exist and the parts, where the tensile strength members not exit, exist to face each other in the coating layers 4. The ribbon cord 7 is formed by lining up plural pieces of such optical fiber cords 5 in such a manner that the parts not present with the tensile strength members are adjacent to each other and integral the optical fiber cords with the ribbon forming layer 6.



improper embodiment.

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DETAILED DESCRIPTION

[Detailed description]

[0001]

[The technical field to which invention belongs] This invention relates to the tape-code branch line which used the tape code which tape-ized the optical fiber code of the suitable diameter of thin for high-density-izing of an office light wiring, and this, and this tape code.

[0002]

[Prior art] Conventionally, as an optical fiber code of this kind of diameter of thin, as shown in drawing 5, it is *****ed around the optical fiber strand 11, using the yarn 12, such as an aramid fiber and a glass fiber, as the tensile-strength field, and what covered the enveloping layer 13 which becomes this from an ultraviolet-rays hardening type resin etc., and was unified is proposed. However, it was difficult for this optical fiber code to be unable to make the rate for which the yarn 12 within an enveloping layer 13 accounts 50% or more, but to be fully unable to advance diameter-ization of thin but to set the finish outer diameter to 0.5mm or less.

[0003] Moreover, the tape code which arranged in parallel two or more [of this optical fiber code], and was unified by the tape-ized layer therefore could not be made into thin meat and thin width of face, either, and has not corresponded to a high-density-ized demand of an office light wiring. furthermore, yarn 12 intervenes, an inequality arises dimensionally and it is unable to make batch weld connection with a usual tape core wire difficult to exist in the periphery of the optical fiber strand 11, and for the yarn 12 as tensile-strength field to carry out the batch elimination of a tape-ized layer and the enveloping layer 13 by the adjoining optical fiber strand 11, the yarn 12 between 11 --, and 12 --, and to interfere in such a tape code, -- etc. -- there was un-arranging

[0004]

[Object of the Invention] Therefore, the technical problem in this invention can carry out the batch elimination of a tape-ized layer and the enveloping layer including the tensile-strength field, when it is in obtaining the optical fiber code which a finish outer diameter is 0.5mm or less in extra-narrow, and has sufficient mechanical strength and is made into a tape code using this optical fiber code, it is to obtain a tape code which is possible also for the batch weld connection with a usual tape core wire moreover, and is to obtain the tape-code branch line using this tape code further.

[0005]

[The means for solving a technical problem] In the optical fiber code which such a technical problem *****s two or more tensile-strength lines to an optical fiber strand, and covers with an enveloping layer and it comes to unify The thing which phase confrontation of the fraction to which the cross-section configuration is made into a rectangle, and a tensile-strength line exists in an enveloping layer, and the fraction not existing is carried out, respectively, and is established for them, and this optical fiber code so that the fraction in which the tensile-strength line of an enveloping layer does not exist may adjoin mutually It is solved by putting two or more in order and tape-izing.

[0006]

[Gestalt of implementation of invention] Hereafter, this invention is explained in detail. Drawing 1 shows an example of the optical fiber code of this invention. In drawing 1, a sign 1 is an optical fiber strand. This optical fiber strand 1 is the usual thing which prepared primary covering and secondary covering in optical fiber open wire with an outer diameter of 125 micrometers, and was carried out in outer diameter of 250 micrometers. Couple ***** and these tensile-strengths fields 3 and 3 are covered and unified by the enveloping layer 4, and the tensile-strength fields 3 and 3 with which three tensile-strength lines 2, 2, and 2 became 1 set serve as the optical fiber code 5 at this optical fiber strand 1.

[0007] And as for this optical fiber code 5, the cross-section configuration of the enveloping layer 4 serves as the rectangle, and 2 sets of tensile-strength fields 3 and 3 are symmetrically arranged on the position by the side of the shorter side of an enveloping layer 4 which carries out phase confrontation on both sides of the optical fiber strand 1, and are arranged on the position by the side of the long side of an enveloping layer 4 as for which the fraction in which the tensile-strength fields 3 and 3 do not exist carries out phase confrontation. The thin thing of 20-50 micrometers of the diameters which consist of an aramid fiber, PBO fiber, a glass fiber, steel wire, etc. is used for the above-mentioned tensile-strength line 2. Moreover, thermoplastics, a heat-hardened type resin, an ultraviolet-rays hardening type resin, etc. are used for an enveloping layer 4. Furthermore, this optical fiber code 5 is not restricted to this domain, although the dimension of the cross section is usually set to 0.28-0.26mm in 0.35-0.40mm and the orientation of a shorter side in the orientation of the long side.

[0008] Drawing 2 shows an example of the tape code of this invention. The tape codes 7 of this example are the optical fiber code 5 of the single core shown in drawing 1, and the thing of the shape of a tape which put 5 -- in order in parallel with 8 parallel, and was unified by the tape-ized layer 6. And it arranges and each optical fiber code 5 has got used so that the fraction in which the tensile-strength field 3 of an enveloping layer 4 does not exist may adjoin mutually, namely, so that the long side side of an enveloping layer 4 may adjoin mutually. By taking such arrangement, the tensile-strength field 3 and 3 -- are in the thing of each optical fiber code 5 and 5 -- located only in both-sides side of a tape code 7. Although the same thing as the resin which forms the above-mentioned enveloping layer 4 is used for the above-mentioned tape-ized layer 6, it is desirable to make lower than the Young's modulus of the resin which forms an enveloping layer 4 Young's modulus of the resin which forms the tape-ized layer 6, and the branching work at the time of branching to each optical fiber code 5 and 5 -- by this becomes easy.

[0009] If it is in the tape code 7 of such structure, since the tensile-strength field 3 does not exist between the optical fiber strands 1 of the adjoining optical fiber code 5 but only an enveloping layer 4 exists, by adjusting the thickness of an enveloping layer 4, the width of face of a tape code 7 can be made in agreement with the width of face of a usual tape core wire, and the spacing between optical fiber open wire can also be made in agreement with the spacing between the optical fiber open wire in a usual tape core wire. For this reason, batch weld connection of this tape code 7 and the usual tape core wire can be made.

[0010] Moreover, since the tensile-strength field does not exist crosswise [of a tape code 7] as mentioned above, it can be made small also in the dimension of the width of face [itself], and high-density-ization is attained. Furthermore, since the tensile-strength field 3 and 3 -- are arranged together with both the front-faces side, a mechanical strength also becomes sufficient thing. Furthermore, with this structure, since the tensile-strength field 3 and 3 -- exist only in both the front faces of a tape code 7, the tensile-strength field 3 and 3 -- are simply put in block, are cut, and can be removed, and the batch elimination-also of the tape-ized layer 6 and the enveloping layer 4 can be carried out further easily.

[0011] Moreover, when it branches and a tape code 7 is made into an optical fiber code 5, this code 5 very thing can also be protected by the tensile-strength field 3 and 3 --, does not need to put and reinforce a reinforcement tube etc. anew, and can use it as it is as a branching code of multi-core.

[0012] Drawing 3 shows an example of the tape-code branch line of this invention. One edge 7a of the tape code 7 shown in drawing 2 branches, this code branch line 8 is made into two or more optical fiber codes 5 and 5 --, it interferes in those points, and the fiber optic connectors 9, such as MU type and SC type, and 9 -- are attached respectively. Moreover, the tensile-strength field 3 with which other-end section 7b exists in the both sides, and 3 -- are excised, the batch elimination of tape **** 6, the enveloping layer 4, and 4 -- is carried out, it interferes in the optical fiber strand 1 and 1 --, and batch weld connection of each of these optical fiber strands 1 and 1 -- is made with this in end 10a of the tape core wire 10 of the number of the said cores.

[0013] If it is in the tape-code branch line 8 of such structure, it is reinforced with the optical fiber code 5 which one edge 7a branches and is obtained, and the tensile-strength fields 3 and 3 with which 5 -- was built in, and even if a mechanical property is high and does not put a reinforcement tube etc. as it is, it can be used, and raw ***** can do high-density nature which a tape code 7 has as it is. Moreover, each optical fiber strands 1 and 1 of a tape code 7 -- Since the spacing of a between can be made the same as that of it of the usual tape core wire 10, connection with the tape core wire 10 in other-end section 7b can also be made by batch weld connection. For this reason, the manufacture becomes small easily and use space can use this tape-code branch line 8 also for narrow space.

[0014] Moreover, in the tape code of this invention, the number of books of the tensile-strength line 2 may not be restricted to three, either, you may be 1, 2, and 4, and parallel lines (a cross section is an ellipse or a rectangle) are sufficient as a tensile-strength line.

[0015]

[Effect of the invention] As explained above, in the optical fiber code of this invention, it can consider as extra-narrow, and it can be used as it is, without a mechanical strength's also becoming high and moreover, putting the tube for reinforcement etc.

Moreover, if it is in the tape code which comes [tape]-izing [this optical fiber code / a two or more tape-ized layer], batch elimination of a tensile-strength line, a tape-ized layer, and an enveloping layer is easy, and the batch weld connection with a usual tape core wire of it is attained. Moreover, the optical fiber code which branched this tape code has a high mechanical strength, and the effect of being able to present a wiring as it is is acquired.

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<u>L10</u>	L8 and L6	0	<u>L10</u>
<u>L9</u>	L5 and L8	1	<u>L9</u>
<u>L8</u>	polyphosphoric adj acid adj amide	42	<u>L8</u>
<u>L7</u>	L5 and L6	0	<u>L7</u>
<u>L6</u>	optical adj fiber adj cord	1005	<u>L6</u>
<u>L5</u>	melamine adj cyanurate	797	<u>L5</u>
<u>L4</u>	L2 and L3	2	<u>L4</u>
<u>L3</u>	ammonium adj polyphosphate	2753	<u>L3</u>
<u>L2</u>	tensile and L1	178	<u>L2</u>
<u>L1</u>	optical adj fiber adj cord	1005	<u>L1</u>

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